**How to read a research paper**

- In preparation for journal club presentation….

- Dr. Anil Koparkar

**Preparing to read a research paper**

* Read the Title and the Abstract
* Title: Is it specific and it reflect the content of the manuscript?
* Abstract: it briefly indicate the purpose of the work, what was done, what was found, and the significance.
* Review in your mind what you know about the topic.
* If not able to recollect, you might choose to read the background in a review or textbook, as appropriate.
  + It refreshes your memory about the topic.
  + It is used as a part of the self- education process that any professional must continue throughout his/her career.

**Parts of any article(IMRaD format)**

* **I**ntroduction (why theauthors decided to do this research)
* **M**ethods (how they did it,and how they analyzed their results)
* **R**esults (what they found) **a**nd
* **D**iscussion (what the results mean)

**Decide what the paper is about**

**Question 1: Why was the study done, and what question were the authors addressing?**

* **Where to find?**
  + The introductory sentences of a research paper
  + Eg. ….Adopted in over 100 countries, IMCI improves health worker’s performance and may lower mortality. However, research has shown that many health workers do not adhere to IMCI guidelines, particularly for the management of severe illness….
  + …the addition of metforminto maximal dose sulphonylurea therapy will not improve the controlof type 2 diabetes,.."

**“Introduction”**

* Define nature and scope of problem, but do not hide inconvenient facts(Limitations)
* Adequate information to allow listener to understand and evaluate present study
* Define lacunae and shortcomings in current state of knowledge
* Key references to support background information provided
* Refer to previous preliminary work and closely related papers appearing elsewhere
* Provide rationale for current study – What gap in knowledge did author try to fill? – What controversy did author try to resolve?
* States aim/objectives of study.
* May briefly state study group, design and methods used, especially why these are better than in previous studies.

**Assessing the methodology of paper**

**Methodology**

* **The three questions** 
  + What has been done?
  + What did author look for?
  + How was it done?

**Question 1: What type of study it is?**

* Qualitative or quantitative
  + Observational (Descriptive /analytical) or Experimental (RCT/community interventions)study.
  + FGD/IDI/KII/ PRA Tools …

**Question 2: Was this design appropriate to the research question?**

*Examples --*

* *Therapy:* Randomized Controlled Trial
* *Diagnosis:* Cross Sectional Survey
* *Screening:* Cross Sectional Survey
* *Prognosis:* Longitudinal Cohort Study
* *Causation:* Cohort Or Case-control Study
* Searching new information: Qualitative tech

**Question 3: Whom is the study about?**

* **Answer the following** **questions:**
  + *How were the subjects recruited?*
  + *Who was included in the study?*
  + *Who was excluded from the study?*
  + If sample from general population is considered, how it was calculated, was it sufficient?

**Question 4: Was the design of the study sensible?**

* **Start with two fundamental questions:**
  + What specific intervention or other maneuvers was being considered,and what was it being compared with?
  + What outcome was measured, and how?
  + Eg. **authors said -**"We compared a nicotine-replacement patch with placebo."

**What they should have said-** "Subjects in the intervention group were asked to apply a patch containing 15 mg nicotine twice daily; those in the control group received identical-looking patches." **An example of:** Failure to state dose of drug or nature of placebo.

**Question 5: Was systematic error(bias) avoided or minimized?**

* Systematic error(bias): A process at any stage of inference tending to produce results that depart systematically from the true values.
* It is any trend in a collection, analysis, interpretation, publication or review of data that can lead to conclusions that are systematically different from the truth.

**Results**

* What did author find?
* Find answer to all points raised in Methods
* No mismatch in numbers between text and tables / figures should be confirmed.
* Have the appropriate statistical analyses been performed on the data?
* Probability and confidence
  + Have "P values" been calculated and interpreted appropriately?
  + Have confidence intervals been calculated, and do the authors' conclusions reflect them?

**Discussion**

* Recapitulation of major findings
* Discussion of major findings in light of available data
* Discussion of important minor findings
* Alternative explanations
* Strengths and limitations of study
* Implications of findings
* Unanswered questions and future research
* Summary / conclusion
* Compare results of presenting study with other similar studies.

**Tips for journal club..**

* Take this opportunity to read relevant topic/s.
* Identify how title is framed which reflects what about the study is.
* Learn how to cite references
* Identify your objectives to present any article in journal club.
* Make sure your objectives get fulfilled at the end of presentation.

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